

Honeywell Devices Guide Ship

By LEWIS COPE

Minneapolis Tribune Staff Writer

HOUSTON, Texas — The spaceship Eagle swept gracefully down to the moon Sunday but it took a tricky bit of maneuvering by its astronauts at the last minute to achieve its smooth landing.

Apollo 11 astronauts Neil Armstrong and Edwin Aldrin had to maneuver around a football-field-sized crater for a final touchdown. They used a pistol-grip hand control, made by Honeywell Inc. workers in the Twin Cities area, to order the final steering commands.

Most of the way down, the ship's guidance computer steered the ship with high accuracy through its required intricate maneuvers.

THE BIG engine used in the landing, the ship's right arm, and the many other systems apparently all performed in excellent fashion.

Still, the spacemen had their hands busy monitoring many things and throwing the proper switches during the descent.

One of the astronauts radioed mission control here after the landing, "The auto (automatic guidance) targeting was taking us right into a football-field-size crater, with a large number of big boulders and rocks for about one or two crater diameters around us.

"AND IT required . . . flying manually over the rock field to find a reasonably good touchdown area."

They were at about 200 feet altitude at the time.

As the ship finally started settling down, the astronauts reported that it was "picking up some dust," starting at between 40 and 30 feet off the ground. But officials here said this in no way interfered with visibility.

The astronauts' bug-shaped lunar module spaceship, which they named Eagle, landed on its long legs in the Sea of Tranquility, which is actually a plains area on the moon.

ARMSTRONG'S first report: "Houston, Tranquillity

Descent

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Descent

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Tranquillity base here. The Eagle has landed."

It was the end to an extremely busy afternoon in space.

The historic event went this way:

One—At 12:40 p.m., Armstrong and Aldrin undocked their Eagle ship from the Apollo mother ship to get things under way.

About 25 minutes later, Michael Collins, alone at the controls of the mother ship, fired its thrusters to move slightly away. Eagle was now all on its own.

Eagle stayed up at the about 70-mile-high altitude for three-quarters of an orbit of the moon after undocking.

Two—On the back side of the moon and out of radio contact with earth, Eagle fired its big descent engine at 2:08 p.m. to slow the craft and start it down on a gradual arc.

Actually, this put the ship into a new orbit with a low point of about 10 miles off the moon. If there had been problems, Eagle's astronauts could have merely coasted around the moon and rendezvoused with Collins in the mother ship.

But everything went fine.

Three — After traveling about halfway around the moon and coming around to the front side, Eagle reached the 10-mile altitude, low-point of its orbit, at 3:05 p.m. Its engines started up again — this time to run for more than 12 minutes straight until landing — for the final descent.

At this point the ship was still 300 miles away from its landing spot. And the astronauts were traveling in an unusual way for men going down to the moon.

Their bodies were parallel to the lunar surface, so the ship's engine at their feet could point forward to act as a brake.

Four — Next they reached a point called "high gate." Their ship was now at an altitude of about 7,600 feet and had only about 5 miles more to go to reach their landing site.

"High gate" is an aviation term used to describe the approach of an aircraft into its landing area.

Now the ship's computer ordered the craft to pitch up, so Armstrong and Aldrin could see forward out their triangular front windows toward their landing site for the first time.

Five—Then they reached "low gate" — meaning the craft was in its final landing area. They had less than a half mile to go to the planned touch down spot. They were only 500 feet off the ground now.